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ABSTRACT

The incidence and nature of research and development (R&D)-related services provided for employers by English and Welsh colleges were examined. Data were collected through the following activities: (1) an initial survey that was returned by 96 colleges in England and 11 in Wales; (2) telephone interviews with those colleges that were currently providing applied R&D-related services; (3) site visits to selected colleges and companies; and (4) circulation of a "work in progress" report to all colleges with a request for additional examples. Of the 107 colleges that returned questionnaires, 50 were currently providing applied R&D services and an additional 17 colleges had definite plans to develop such services. Of the remaining colleges, 36% generally agreed that such activities could be relevant to the college mission. Key reasons for engaging in applied R&D included the commercial nature of the activity as a service to business and source of income for the college and the benefits that college staff members receive from participating in professional and research-related activities. The R&D services being provided assumed a wide range of forms including the following: research driven by developmental needs; advice and consultancy; audits and evaluations; demonstration projects; specific services; brokerage, support for product development; network creation and support; and support for business incubation. (Contains eight endnotes. The series introduction is appended.) (MN)

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learning and skills development agency

ED 478 447

a basis for skills

further supporting business

research-related support for company innovation and development

Maria Hughes
and Geoff Stanton

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Feedback should be sent to:
Information Services
Learning and Skills Development Agency
Regent Arcade House
19–25 Argyll Street
London W1F 7LS.
Tel 020 7297 9144
Fax 020 7297 9242
enquiries@LSDA.org.uk

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Further information

For further information about the issues discussed in this publication please contact:

Maria Hughes
Research Manager
Learning and Skills Development Agency.
Tel 020 7297 9118
mhughes@LSDA.org.uk

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Summary

This paper comments on an LSDA research project that investigated the incidence and nature of research-related services provided by colleges for employers.

The research was conducted by means of a survey, follow-up telephone interviews and site visits to colleges and companies.

The study found that there were many examples of interesting work in this area. Although the provision of research-related services is not widespread across all colleges, the work is sufficiently developed in some colleges to provide a model that could be extended more generally.

A key factor in the development of this work appears to be the personal interest and enthusiasm of individual members of staff. Attracting people with relevant and recent industrial experience, who are experts within their field, is currently a major concern within the FE sector. The development of research-related services might be hindered by this but it could also provide opportunities for new staff, under the tutelage of experienced staff, to develop their expertise.

An earlier version of this paper was circulated to key players for consultation. The paper was received with considerable interest, and helpful suggestions for taking the work forward were provided. Many of these have been incorporated into this report.

Introduction

Businesses in a modern economy need to review their products and services regularly and often if they are to improve their performance. The UK spend on research and development – which is central to product innovation – is still lower than its competitors.[1] Supporting business-related research and development (R&D) in small companies is potentially a key role for FE colleges. LSDA has been investigating the nature and extent of R&D services that colleges currently provide to local companies and public sector organisations.

This publication reports on an LSDA project[2] which explored whether there is a distinctive, and hitherto under-developed, role for colleges in supporting business innovation and development.

Background

The term 'research' was interpreted broadly in the study to encompass a range of activities that help businesses to innovate and to improve their performance. Consideration was also given to the unique features of these services, and how they differed from research undertaken by universities.

Many colleges provide training or training needs analysis for companies and undertake market research to inform their own provision. These activities were not the focus of this study except where the work was being undertaken for the benefit of others, such as companies or public sector bodies.

Method

The research method consisted of:

- an initial survey of all FE colleges in England and Wales to identify the incidence and volume of research services provided for business
- telephone interviews with providers of these services in colleges
- site visits to colleges and companies to obtain case studies and further information about the service
- a 'work in progress' report,[3] circulated to all colleges, with a request for more examples of this type of support
- an expert seminar to discuss and extend emerging findings
- a consultation paper, circulated to key players such as government departments, colleges and the academic community and representatives of the business community.

Findings

Defining the service

- For the purposes of the project a working definition of the type of activity being studied was provided as follows.

  'Research and development that colleges conduct on behalf of companies, or jointly with them, that may lead to:

  - new products or services
  - the identification of new markets
  - the improvement of quality, efficiency or internal procedures.'

  Training activities were specifically excluded from this definition.

- Questionnaires were returned by 96 colleges in England and 11 in Wales. Of these, 44 colleges in England and six in Wales said they provided applied R&D services. An additional 15 colleges in England and 2 in Wales had definite plans for the development of such services, either college-wide or in specified areas. The proportion of colleges in England either actively engaged or seriously considering the development of business-related, applied research and development is small – approximately 15% of all colleges and 20% of general FE and specialist colleges. In Wales, the percentage is much higher at 33%, although the number of colleges is lower.

- In addition, there was general agreement from 36 of the respondents not providing such activities that they could be relevant to the college mission:

  '...essential part of our work with small businesses, vital element of local economic regeneration...'

  'We consider it a key part of our strategy. Relationships with SMEs [small and medium-sized enterprises] are very important. The local LSC [Learning and Skills Council] sees workforce development as central to our mission. It helps to keep staff in touch with industry standards.'

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- Many respondents noted the importance of the work, both to the college and the companies:

  'The college is actively encouraging staff and students to undertake research to complement and underpin teaching activities.'

  'Key reasons for involvement are:

  - the commercial nature of the activity as a service to business and the income it generates
  - the benefit to staff of participation in professional and research-related activities.'

  'We wish to develop the whole concept of R&D to meet both our internal needs and respond to the government's agenda relating to develop more short courses and curriculum development, to better meet the needs of industry.'

- Others gave reasons for their reservations:

  'We do not have staff capacity for this activity.'

  'Is there a market for this type of work?'

  'We are very committed to in-company training and workforce development but lack expertise to do significant research and development.'

  'Although the college is not engaged in this activity at present, a limited development of research activities would enhance employer/college relations as well as giving staff in college opportunities to develop their professional experience. Funding and time constraints would be the principal barriers to this activity.'

- Further investigation of the nature of the services provided by respondents revealed that, although it is only a small proportion of the work of colleges, it is generally innovative and useful to the companies concerned.

- The range of services included:
  - technical support and advice for small engineering companies
  - access to design facilities
  - field testing (eg of animal foods)
  - customer surveys
  - production of prototypes
  - project evaluation for voluntary bodies
  - environmental monitoring and audits.

- The services therefore go beyond what is usually called 'research' to encompass support for innovation and development.

- Several respondents to the survey commented on their plans to develop the research function in their college. These developments are of interest in the context of this study if they do not simply replicate academic research and play to one of the strengths of further education in its capacity to apply vocational knowledge to real work situations.

- Colleges are capable of providing a range of activities in addition to training which have in common the aim of enabling other organisations to develop and improve their products and performance – training needs analysis is a relatively developed service, for example. However, the study was looking for services that extended beyond analysis and provided business, rather than training, solutions. Some of these result in mutual benefits for the college and for businesses.

- Providing support for companies' R&D could therefore be an important aspect of college responsiveness to business and industry. Enabling businesses to innovate is likely to produce a derived demand for training. Stimulating innovation-led training may be a more fruitful approach to developing greater productivity than training for its own sake.

- Our research suggests that a key driver for this work is the enthusiasm and expertise of individual members of staff. The activities may therefore be marginal to the general work of the college or department, which is perhaps why examples of the work are hard to find. Specialist staff may have built a reputation with local industry for this kind of work over a period of time, but it may be incidental to their main duties.

- Involving lecturers in such work makes a significant contribution to both staff development and the relevance of other college provision, so benefiting learners and employers. However, there is a major succession problem in colleges as older, experienced staff retire and are replaced by people without a substantial industrial background or the specialist skills required to undertake this work.

- The employers we interviewed during the course of the research placed great value on the support they are getting from colleges. However, structural and funding issues may hinder the further development of the service. Consideration needs to be given to the establishment and maintenance of an infrastructure for this work, and to guaranteeing its quality.
- The study has highlighted the need to reconsider the role of colleges in supporting business innovation. There appears to be a link between business-related R&D, productivity and skills development that should be further explored. We suggest that a shift is required in the perception of colleges' purpose to encompass support for innovation and productivity.

Scope of the activity

The examples emerging from the study suggest a broad range of support activities for company development and innovation being provided by colleges as described below.

- **Research.** This usually takes the form of research driven by developmental needs, rather than development attempting to apply research findings. The work may take the form of field trials.

> *A college printing department helped local companies by testing printing plates designed for inks that were water- rather than solvent-based.*
>
> *This transition was important in reducing pollution, but meant that the number and nature of the microdots making up photographs had to be reviewed. In return for pre-field-testing the new plates the companies donated samples of them to the college for teaching purposes.*

- **Advice and consultancy.** This can vary from ad-hoc technical advice through support with the preparation of business plans to advice on the purchase of new equipment.

> *A college with considerable expertise in digital imaging has found that other organisations considering the purchase of equipment are prepared to pay consultancy rates for the advice of its staff. This also involves some analysis of the organisations' systems and aims to identify their needs.*
>
> *Other colleges have found a similar demand for advice on CAD and CAM software.*

- **Audits and evaluations.** These may include environmental and safety audits for small firms and evaluations of projects for voluntary organisations.

> *One college has conducted a 'deprivation analysis' for a local authority to support the council's bid for European funding. Another has evaluated a project being managed by a local voluntary organisation, as part of its bid for a further grant.*

- **Demonstration projects.** Such projects may make use of specialist facilities, such as agricultural college farms or horticultural college gardens, or equipment may be demonstrated on company premises.

> *A college in the south west has developed an organic demonstration farm, encompassing many industry-led, private-sector funded, near market trials and development work.*

- **Specific services.** These include design, market research and access to specialist equipment.

> *As part of its support for small businesses in their start-up phase, a college that undertakes call-centre training offers the businesses free use of the call centre for marketing purposes. This also provides the students in the call centre with useful experience of working for real businesses.*

- **Brokerage.** Some colleges act as a 'broker' between firms and universities when research expertise that the college cannot itself provide is required, or where each party needs to be 'interpreted' to the other.

> *In one case this involved commissioning some research into power sources from a university; in another it involved contacting a firm manufacturing wind-turbines in the Netherlands; in a third involving a local distributor of a high-tech product.*

A few colleges are members of regional consortia, which allow firms to make use of specialist knowledge or facilities available in other colleges, with the local college acting as a broker.

> *In the north west 26 colleges are part of a group of organisations, which also includes six HE institutions, six training providers, and 30 employer groups. One benefit of this is that colleges approached by a local employer may make contact, on their behalf, with another college with more appropriate expertise or facilities.*

- **Support for product development.** Not all the examples of R&D occur in the field of engineering technology. One college has a product development manager who previously trained as a chef.

> *The product development manager has supported a local pig farmer by developing new pies, sausages and pates. The college has also investigated the shelf life of the various products and developed new labelling and packaging. The farmer now has products that have a higher 'added-value' and has been able to increase both his turnover and the number of his employees. At the start of the work the farmer had severe cash-flow problems because of restrictions on the movement of his stock caused by the foot-and-mouth outbreak. The project required matched funding, and it was agreed that this could be an 'in kind' contribution (in the form of eight pigs).*

Technological developments can have applications in non-technical environments.

> *A college has devised pedometers for cows that allow farmers to note when they are moving about more than usual. This is a sign that they are on heat and ready for insemination.*
>
> *A college that worked with fish farms was set the task of finding a means of humanely killing large numbers of small fish, and designed an electric fish-stunner for this purpose.*

- **Creating and supporting networks.** Some colleges support SMEs by creating networks or through membership of existing networks. This support may simply be hosting or convening meetings, but training and R&D needs may emerge.

> *One college supporting land-based industries is setting up a 'Rural Enterprise Network' enabling rural businesses of various kinds, varying from small-holders to people offering bed-and-breakfast, to meet for mutual support. The college plans to convene the meetings at first, but then to withdraw to a support role, ready with technical, legal, and business-planning advice as required.*

- **Support for business incubation.** This may be particularly appropriate in sectors with high levels of self-employment and may be best undertaken in partnership with other support services for business.

> *One college intends to make use of the fact that the local authority will be setting up an 'incubator facility' for new companies next to one of its buildings on a trading estate. It will link with the enterprises and offer both training and R&D support in an effort to reduce the high rate of early failure that sometimes occurs.*
>
> *Another college has a group of 'business rehearsal' clients who are planning to set up enterprises, and offer them support through its SME Technical Support and Learning Centre. This can include up to five days of on-site consultancy.*

Terminology

It has so far proved difficult to find an agreed term for the R&D-type services being offered by colleges to business. Several options have been proposed. Some considered 'research' to be inappropriate, as the solutions offered to companies were likely to draw on existing knowledge, rather than create new knowledge. The term 'knowledge exploitation' was considered by some to be more accurate, and is the terminology used in Wales for a dedicated support fund for this type of activity.

The overall purpose of the service is to support firms' innovation and development, and research should relate to the development and improvement of products and performance. Application of knowledge and experience is central to the service. Typically, it involves some form of problem-solving.

Responses to terminology in our consultation were mixed. Some made the point that we should describe the service in terms of business support and solutions to avoid confusion with traditional R&D. However, it may be beneficial to challenge some assumptions about what is 'real' research, and look at how principles of enquiry, which are accompanied by timely and tangible results, could improve the quality of all forms of research.

Given that both large and small companies are being persuaded by other government initiatives to increase their research and development capacity, with links to tax and other incentives, it would seem appropriate to use the term business-related R&D. However, the crucial link between research and development should be emphasised and in practice the service should encompass a broad range of activities supporting business development and innovation.

A role for colleges

There appears to be a need for applied research and development, especially for small and medium sized companies, that is not and could not be filled by the research provided by most universities.

Colleges are best placed to meet this need because of their experience in:

- working with small companies that find it culturally or organisationally difficult to liaise with a university
- building on existing links – for instance, those created by the previous involvement of the college in providing training for some of the workforce or even the owner–managers themselves
- being able to 'talk the language' of the SME owner–manager, and being able to adopt a practical approach to the application of research in the context of that particular business
- offering expertise in an occupational area in which universities do not usually operate.[4]

In some rural areas, colleges are geographically closer than the nearest university, and especially where they have outreach or collaborative arrangements with universities, there may be scope for a wide range of research and development services for business.

Leading edge or tried and tested?

While few of the colleges in the study were involved in leading-edge research in the university sense, most were helping to introduce techniques or systems that were new to the company concerned.

A college working with a distributor of programme logic control systems and a manufacturer of control panels for luxury yachts identified that since each panel controlled a number of services it also involved considerable cabling (approximately five tons of it in a 'super yacht'). Using 'off the shelf' components the college developed a prototype panel, involving a touch-screen and fibre-optic cabling. This reduced the weight of cabling by 80%. The manufacturer is now requesting additional training for their staff to support the new product.

However, what constitutes 'leading edge' may be a matter of perception. There are also benefits in applying tried-and-tested solutions. It reduces some of the risks to the business and may be quicker and less costly to implement.

Origins of the service

In some cases, previous funding that supported the purchase of a specific piece of equipment, and/or subsidised initial provision of consultancy, has stimulated involvement in business-related R&D. The equipment has attracted the attention and involvement of companies through, for example, providing materials testing or the production of prototypes. Further work of a similar nature may then have been provided.

Major companies may have provided colleges with facilities that can subsequently be used to develop a wider service. Some colleges with a substantial proportion of HE provision have been able to use the HE Development Fund (managed by HEFCE) for developing facilities.

An FE college with a significant amount of HE provision has a wind tunnel to support its courses in aeronautical engineering. It has used this to undertake calculations of aerodynamic drag for freestanding traffic lights to ensure that they meet government regulations. This work was done for a small contract company.

Higher education in further education

The co-existence of HE provision in FE colleges can promote a research culture, because staff wish to develop this aspect of their expertise. Clearly, not all of this research is business-related, but the presence of research as a regular activity may secure acknowledgement of it in college quality systems.

However, a prevailing academic research tradition could also hinder the development of business-related R&D. Expectations on the part of the college of a formal research record may not match the client's requirements for practical solutions, and may skew the service towards research which is not as immediately useful to the company concerned.

Engaging students in research

Students may engage in projects as part of their course, particularly if undertaken within work placements, making these more productive for all concerned.

Students on fish-breeding courses conduct annual audits of the number of fish in ex-gravel pits, on behalf of the companies that manage them for leisure fishing.

Students on a travel and tourism course have acted as 'mystery shoppers' in local travel agents, and produced a report on the quality of customer service.

However, colleges raised concerns about guaranteeing quality, and legal issues relating to public liability insurance and protection of patent rights which may need to be resolved before involving students. Another approach may be to support an employee of the company to undertake business-related R&D, perhaps as part of a continuing professional development (CPD) experience.

Supporting the local economy

Colleges are being encouraged to consider the distinctiveness of their mission and its relationship to meeting the needs of employers; therefore the development of business-related R&D as a strong aspect of their provision could be seen as an attractive proposition. Financial returns to the college may be modest, but the development of relationships and reputation may have a long-term effect on the take-up of learning. Business-related R&D is also an effective means of marketing the other services offered by the college. Companies are naturally more interested in support to improve performance generally, than in training per se. In the longer term, however, the development of new technologies, systems or markets may result in the need for training.

A college technology department became involved in a DTI-funded project that aimed to improve the efficiency of small engineering companies by enabling them to install more sophisticated control devices for their machinery. The project also involved the equipment suppliers, a national research agency and a university, but the college was crucial in enabling its other partners to gain access to appropriate small firms. The equipment was not the very latest technology, but was new to the firms concerned. Samples were provided free, but the college worked with the companies in setting the equipment up and in measuring its effects.

The college later helped some of the companies in preparing business plans to justify the funding of further purchases, and responded to requests for the training of supervisors and operatives. The training was provided onsite, and the college also developed CD-ROMs that operatives could use to remind them of the necessary procedures at later dates.

Marginality and quality control

Identifying the incidence and volume of these services proved to be difficult for two reasons:

- lack of understanding of the type of activity being sought
- lack of awareness of senior managers that such activity was being provided.

As with much innovative work, business-related R&D may depend on the initiative and networking of individual staff; it rarely has a designated person responsible for its coordination and development. The lack of visibility inside or outside the college hinders dissemination and awareness of what others are doing in this area. Locating this work within Ofsted/ALI Common Inspection Framework is also difficult in the current arrangements. Because of this, and the marginality of the provision, business-related R&D could be located outside the college's usual quality assurance procedures. Both good and poor quality work may therefore go unrecognised.

Staff and curriculum development

Involvement in helping companies develop and innovate can be an important vehicle for the professional and industrial updating of staff teaching on vocational programmes. The materials and techniques involved can also contribute significantly to the development of the vocational curriculum. Although the key staff are likely to be in heavy demand for teaching, it is nevertheless important that the R&D service is not seen in isolation from the rest of the college and its provision.

A small local company had designed a laptop computer that was capable of working in very hot countries with little or no technical back-up. They wished to explore the possibility of using power from a range of sources, including solar panels. The problem was to design a power supply unit that could cope with this and the local environment. The college agreed a specification, tested a range of solar panels on the college roof, and identified a manufacturer of integrated circuits that would provide sponsorship 'in kind' in the form of free components, because of the global potential of the innovation.

The college is now producing a prototype and plans to enter into a contract with the firm, securing royalties for every power unit sold. The 50 hours of staff time so far used has been funded from the Standards Fund as part of the college staff development programme. The work will also have an impact on the curriculum, ensuring that students are kept up to date with the latest applications of technology. For instance, it is hoped to involve them in monitoring the use of the computers by satellite link.

Interest from government departments

Although it is still more common for government departments to involve universities than colleges in research-related initiatives, there is evidence that they are beginning to realise the potential of colleges in developing some vocational sectors.

In the case study cited earlier, where DTI pump-priming funds enabled a college to work with engineering companies, the initial contract was with a university, which brought in the college because of its contacts with small firms.

DEFRA has recently established a network of 'demonstration farms'.

A consortium of colleges has won a DEFRA contract to establish and manage a pilot scheme that aims to test the effectiveness of different types of demonstration farms (and associated activities) in improving the performance of farms. The aim is to enhance both economic and environmental performance, and also the integration of farms into the food chain and the rural economy.

The DEFRA initiative builds on the existence of land-based colleges' working farms which are used for training purposes, but it raises the question of whether other employment sectors, and the government departments working with them, could adopt this approach. Colleges have other, similarly specialist facilities, such as training restaurants and motor-vehicle workshops, which could be upgraded to provide testing and demonstration services for new equipment and techniques for the benefit of small businesses. Companies supplying the industries in question might also have an interest in supporting such demonstration sites.

Employer-led activities

Colleges are also contributing to company-initiated research and development.

Design and rapid-prototyping. *A college in the north east of England has set up a 'digital factory' on a local trading estate. It has modern computing facilities and state-of-the art design software, provided by a multinational IT company. Designers and owner-managers of local firms can visit the factory, and with coaching from college staff can convert their ideas into working drawings. These drawings can in turn be converted into three-dimensional models with a 'rapid-prototyper', and used for marketing and testing purposes.*

Testing. *Another college in the south east has supported a local company by calculating shear forces on fuel valve safety rings.*

Although most of the companies being supported are small, some have developed worldwide markets, and in turn contract work to other local firms.

A college in the north west is offering ongoing technical support to a small engineering company designing and producing innovative couplings for high-pressure hoses, such as those used in the fire-service. The owner-manager of the company creates the new designs, but needs occasional support in terms of working drawings, technical calculations and testing of materials. This support is paid for at commercial rates. The couplings are now being used by fire-services in many countries, and other couplings are in use by an American aircraft manufacturer.

Companies may pay the college the full commercial rate for this work, but sometimes the payments are 'in kind'.

Seed trials. *Agricultural colleges often conduct trials of new seed varieties, in return for which the seed company gives free supplies to the college farm.*

Equipment testing. *A college photography section has an arrangement with a manufacturer whereby their students can work with early versions of new cameras, in return for reports on usability and reliability.*

Packaging types of support

A combination of interventions and kinds of support may be required.

One college called in to offer technical advice to a rapidly expanding furniture company found a major but previously unidentified need for the design and implementation of quality assurance systems. Another, when undertaking an audit of IT requirements, found itself being asked for advice on appealing against Council Tax banding.

'Knowledge exploitation' in Wales

The Knowledge Exploitation Fund (KEF)[5] set up by the Welsh Assembly is available to both universities and colleges. The fund has five strands: helping institutions generate an entrepreneurial culture; boosting skill levels in industry; expanding the skills of the trainers (including support for their placement in industry and research establishments); accelerating the commercial exploitation of research; and stimulating technology transfer.

In the example that follows, the coordinator's secondment is funded by KEF, which has also helped to equip a college laboratory to undertake some of the technical tests required.

A college in Wales has seconded a member of its staff to work in and with a local engineering company. The company wishes to develop a small marine platform (or buoy) that can be used to assist ships entering port. The project is being coordinated by a member of the college staff who also draws on the expertise of other college staff as required. Most of the development work uses known technology, applied in a new context. Some research will be needed, and the college is inviting tenders from universities who wish to undertake this.

Extending and consolidating the service

Supporting businesses through applied R&D is valued by employers and has considerable potential for further development. There are significant mutual benefits. As well as helping firms to adapt and grow, the activities can help colleges to establish a more robust and realistic relationship with individual companies and the local economy, to the benefit of their curriculum and students.

As the case studies demonstrate, companies need help in preparing business plans or applying for grants, as well as with technical issues. Further help may be needed after the successful development of a new product, for example with packaging or marketing strategies, or skills training. Business-related R&D services need to sit alongside these other support activities, and may drive greater employer involvement in other learning activities.

Colleges need to be flexible in their response, able to mobilise a wide spectrum of their resources and expertise. This is a fundamental shift in the way colleges respond to business clients (which could also be mirrored in responding to individuals if customised learning programmes become a reality). There is therefore a case for organising these activities into a service that some colleges could offer more formally.

This service would aim to support the effective application of existing knowledge in local firms and other organisations. In this it would differ from what might be seen as the primary purpose of research in universities, namely the creation of new knowledge. The intended outcomes of the service would not be to publish articles in academic journals, but to have a positive impact on individual companies and the local economy. There may also sometimes be a place for evaluation reports, but these would be of secondary importance to the business application.

Innovation-led training rather than training-led innovation

A recent SKOPE report[6] on employer training measures echoes the Performance and Innovation Unit (PIU) report[7], in concluding that, '...on their own, interventions aimed at boosting the supply of skills are unlikely to automatically transform organisational strategy. To do this, other interventions made through different means of business support may be necessary to securing and sustaining systemic change...'

A recent DfES research brief,[8] noted that:

Measures to encourage small firms with a 'low-trainer' orientation to provide more training by reducing money, time, or other such barriers are likely to enjoy only a very limited degree of success. Policy may therefore need to be linked much more strongly to product and service development strategies for small firms. Such policy initiatives are more likely to be more costly.

The findings of this project suggest that if such product and service development strategies build upon the existing network of colleges, the cost could be reduced. If the intellectual capital of colleges is to be realised, a shift in the perception of their role is required so that they are firmly embedded within the supporting infrastructure for economic development. This will require a fundamental re-think of college mission and a substantial investment in staff.

Assumptions that increasing and updating the skills of the workforce will result in more efficient and innovative companies may be flawed unless the company and its systems are able to put these skills to good use. If a company is supported to innovate, training needs will derive organically from the development of the company. This is more likely to be valued by the employer than something that the firm has to be persuaded or given incentives to undertake. Therefore, workforce development might be more effectively promoted if colleges were funded to help companies develop and innovate, rather than funding being used (for instance) to market or subsidise qualifications and courses. The link between R&D, productivity and skills development needs to be clearly defined and the fact that colleges are capable of supporting all of these activities in a 'one-stop shop'.

The development of college staff and learning programmes

It is clearly important that staff teaching on vocational courses should be up to date, not only with the technical aspects of their specialism but also with the working environment for which they are preparing their students. Their credibility in this respect is even more crucial when they are working with employed learners who are using modern techniques and systems at work.

Many colleges have staff development programmes that enable lecturers to attend updating courses or to undertake industrial placements. FE staff secondments to a company to help develop a new product, market or system, or to introduce a technology new to that company, would be a very powerful approach to staff and curriculum updating.

Some of the colleges identified in the research were using the FE Standards Fund for this purpose. Such a secondee could also draw in other expertise from the college, as required. For instance, a technologist might find that to make an innovation effective advice was also needed on design, drawing up a business plan or renegotiating job descriptions.

Actively working with companies in this way would enable staff to update curriculum content and design relevant learning materials. The staff involved would be a source of advice to awarding and regulatory bodies on the appropriateness of current qualifications, occupational standards and assessment regimes.

Making use of the resources, position and status of the college

Where relationships between college staff and companies are well established, employers value the fact that colleges are local, stable, offer a broad spectrum of expertise, are interested in the application of knowledge, and 'talk their language'. In addition, the college may have trained the employees of the company, the owner-managers themselves, or be educating their children. When working well, these factors contribute to the development of trust, particularly with small companies.

From this position colleges can offer advice on such things as the purchase of new equipment – and may even be able to demonstrate its use in the college. They can support a firm in upgrading its systems to meet the more onerous demands of the bigger companies it supplies, and connect this with the need for re-training.

Colleges can also provide links to other agencies, equipment and material suppliers, and even other colleges or universities, if that is where the best support can be found. To maintain the ability to be such a 'broker' it is important that the college acts in partnership with other agencies or organisations, rather than competing with them and is not seen to have an ulterior motive by the company.

Resourcing issues

If a sustainable, business-related R&D service is to be developed it will require an appropriate infrastructure. In the course of our work it has been suggested that this may require a dedicated funding stream. Demands for training for which fees would be charged may emerge naturally from R&D services, which themselves could be provided at a commercial rate. However, an assured funding stream for the service infrastructure, particularly in its early stages, would ensure that it develops without being distorted by the need to secure 'quick wins' from training in the short term.

A changing role for colleges

There is a precedent in the case of public funding for universities, which provides separate funds for teaching and for research, reflecting the legitimacy of both functions. Colleges could also have the dual functions of teaching and development. Just as it is accepted that the teaching activity of universities is enhanced by the involvement of their staff in research, so the design and delivery of vocational courses would benefit from the involvement of college staff in this development work.

Colleges could justify funding some of this support from their core resources, given its contribution to the positioning of the college as a support for business. However, as the support offered should contribute to the medium-term prosperity of the firm, or at least make it less vulnerable, there is a case for the companies to pay the full commercial rate for the service. Some colleges are better than others at educating firms about the business case for such expenditure, and some even report that it can be easier to sell a service than to sell training – for which employers have come to expect a subsidy. However, many firms most in need of support remain those least able or willing to pay for it – at least until it has proved its worth.

It is noticeable that many (though not all) of the colleges active in this area support it through short-term funding (often from the European funds available to deprived areas). Such sources are too haphazard and temporary to form the basis for a national strategy, and many of them require matched funding, which can be a difficulty. Some colleges are able to base the work around a facility provided though a relationship with a particular company or through non-FE funds such as the HEFC's Development Fund. No analogous FE funds are available in England, though some colleges have structured their Centre of Vocational Excellence (CoVE) bids to make a contribution.

In summary, dedicated funding might be required to:

- enable a college to provide the necessary infrastructure for a responsive service of good quality, and to develop the capacity of the staff
- pump-prime support activities for some firms
- make such activities a permanent part of the college's mission.

Caveats and pitfalls

Distraction from the core business of colleges

It is likely that a well-managed applied R&D service would make an important contribution to the quality and relevance of vocational education and training in colleges. However, to bring about mutual benefits to the company and the regular curriculum, most vocational teachers should be able to engage in this work as part of their normal duties. This may be by direct involvement, or by being part of a research or back-up team. If a separate team of staff were created to provide the support service its contribution to the renewal of the curriculum and the expertise of the staff team would be diminished. This is an undoubted challenge to the way colleges are currently organised, which is predicated on the basis that staff are primarily engaged to teach, not to provide R&D.

- Not all colleges, or all parts of colleges, would wish or be eligible to engage in business-related R&D. It may be prudent to distinguish between the development of existing capacity in colleges and development of new college capacity.

Competition with other providers

Colleges could be seen to be competing unfairly with commercial providers of research and development consultancy but dedicated funding, with the accompanying dedicated accounting procedures, could reduce rather than increase the likelihood of this happening, intentionally or unintentionally.

Competition with other providers of support from government agencies is also a potential problem. Boundaries need to be respected, and links made with other organisations such as the DTI Small Business Service and Business Link. Agencies that are working for the development of local business should in any case be collaborating to maximise the use of public funding and minimise confusion for the client.

Collaborative approaches are likely to be successful if the contribution of colleges is factored in to the support for business from the outset, with their contribution acknowledged and valued by other players.

Difficulties in recruiting well-qualified staff

Succession planning is already a particular concern for many colleges, as experienced staff with connections and credibility in specific industries reach retirement. It is difficult at present to recruit equally experienced replacements because of disparities in salary levels between education and industry. The need for younger staff to enhance their experience through working with companies in development activity is therefore even more important. Staffing issues must be addressed if the FE sector is to play its full part in the development of a successful economy and skilled workforce. Developing staff through involvement in real projects in business and industry could be a powerful method of upskilling.

Moving forward

There are already some interesting precedents and examples of this development role for colleges as described below.

- The Knowledge Exploitation Fund in Wales is available to both colleges and universities. At least two of its five strands are being used to underpin college support for companies.
- DEFRA is using some land-based colleges as vehicles for demonstrating the possibilities and effects of new methods and machinery to farmers, and as bases for networks of small rural businesses.
- The DTI has funded colleges to work with companies in introducing modern control systems for machinery, and in working out the business case for them.

  The success of this work should be judged in terms of its impact on the efficiency of the firm or the industry, and the benefit to the local economy, rather than in terms of the performance of the college or the production of research reports. Impact may also not be apparent in the short-term and should be judged over a 3–5 year period.

Specific action

There is a need to develop a critical mass of colleges and staff involved in research-related services to business. It may be useful to form a network of internal champions across colleges, who could assist in the development of the service.

The development could be linked to the CoVE programme, with demonstration projects to pump-prime the service, testing its feasibility in different circumstances.

A programme of reciprocal secondments between industry and further education could strengthen awareness of the applications of knowledge and develop good relationships between education and industry.

Recognition of the pivotal role of colleges in supporting SMEs – acting as sounding boards and honest brokers could also benefit both companies and the colleges.

There are particular problems concerned with health and safety in relation to liability and insurance cover that some colleges could help to solve.

A major outcome from the development of research-related services for business could be that employers are able to get what they need, rather than what the colleges have on the stocks. If the service were seen as an integral part of what colleges do, rather than a marginal money-spinner, it could even result in incremental modifications to the range of provision across the whole sector. Such a development would take colleges forward in their responsiveness and relevance to business and industry.

Notes

[1] DTI (2002). *R&D Scoreboard*. Department for Trade and Industry.

[2] *Researching for business*. LSDA project RPM 491.

[3] Hughes M (2002). *Researching for business*. LSDA work in progress series, RPM491WPI.

[4] LSDA has been developing a model for a specialist 'college for business' concentrating on the needs of business and industry. This work is explained fully in *Developing the 'college for business' in Sussex*. One element of the model concerns research-related support for company innovation and development.

[5] For further information see www.kef-wales.org.uk

[6] Keep E, Mayhew K and Corney M (2002). *Review of evidence on the rate of return to employers on investing in training and employer training measures*. SKOPE research paper No 34 summer 2002.

[7] Cabinet Office Performance Innovation Unit. (2001). *In demand – adult skills in the 21st Century*. Cabinet Office.

[8] Kitching J and Blackburn R (2002). *The nature of training and motivation to train in small firms*. Research report RR330. Department for Education and Skills.

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